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ABSTRACT

To talk about the dissemination of research is to talk about the relationship between theory and practice. A body of empirical and conceptual knowledge has accumulated in an area known as the dissemination and utilization of scientific knowledge. Researchers and practitioners will interact at two points: as the knowledge base is transferred, and as practitioners communicate their needs to researchers. This paper centers on the dynamics regulating the process of transfer of knowledge from research centers to schools and teachers. A robust finding in the research utilization literature is that when researchers have used an approach to the dissemination of their results characterized as "sustained interactivity," the impact of the study on users and user organizations is pronounced. Basically, sustained interactivity involves multiple exchanges between researchers and potential users of that research at different phases of the study. To illustrate the dynamics of sustained interactivity on users and researchers, a recent vocational training research program in Switzerland, called "Education et Vie active," is described. (5 figures) (22 references) (MLF)

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LINKING THE PRACTITIONER AND RESEARCHER COMMUNITIES FOR SCHOOL IMPROVEMENT

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Keynote address at International Congress for School Effectiveness and Improvement (Victoria, B.C., January, 1992)

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INTRODUCTION

At the base of "school improvement" efforts are designs, products, practices and activities whose source is elsewhere, typically external to the school. The current concern with "authentic assessment" and "higher order cognitive activity," for example, stem from university centres, prompted by needs expressed -- or subtly forced upon them --by practitioner publics.

This means that our concern with school improvement owes a good deal to matters about which we know far less, in particular matters having to do with the production and transfer of knowledge. from which school improvement is constituted. Paradoxically, then, we are more knowledgeable about how schools use knowledge derived from outside than about how universities deliver it.

On this score,however, the practitioner community is fairly merciless. School people often claim that much university knowledge, delivered in its conventional form, is of limited utility, that there is a long lag time between the expression of local needs and the delivery of a research product, that social science research is over-rationalized (the universe of schooling is far more passionate and unpredictable than we let on) and nave, that it is hard to access, often irrelevant and framed in ways which are not assimilable to classroom life.

For each of thee arguments, of course, the knowledge-producing community has a response (overconcern with quick answers to complex matters, distortion, simplification, politics, "strategic use" for one's own ends,etc.)

THE TWO UNIVERSES

Another way of putting this is to claim that to to talk about the dissemination of research, as I am about to do, is to talk about the relationship between theory and practice. I have argued elsewhere (Huberman, 1990) that much of the literature on this topic has been of a rhetorical nature. We find it periodically in keynote speeches or occasional papers or in the report of a blue-ribbon commission addressing the "two communities" problem: the difference in norms, rewards and working arrangements between researchers and practitioners.

There are, however, bodies of knowledge that bear on this issue. For example, the process of dissemination of research can be seen as a particular instance of more general constructs derived from the sociology of knowledge (Berger and Luckman, (1967). Work in communications, in person perception, in social influence also inform this field. Action research addresses directly the theory-practice relationship as well.

There is, however, a specific and fairly elaborate body of literature pertaining to this area. One can trace its roots back 50 or 60 years, to the seminal work of Kurt Lewin, Ronald

Lippett and Paul Lazarsfeld. Gradually, a body of empirical and conceptual knowledge has accumulated in an area come to be known as "the dissemination and utilization of scientific knowledge" (hereafter D&U").

Basically, this work relates to the ways in which research knowledge becomes practice knowledge, and with the transformations undergone in the process of transfer from one realm to the other. Over the years, empirical studies have explored, then sought to replicate the main findings from earlier work. In fact, if one reviews the most recent syntheses of this literature (e.g., Glaser et al., 1983; Beyer and Trice, 1982; Thayer and Wolf, 1984; Huberman, 1987), a strong case can be made that few, if any, fundamental conceptual changes have been forthcoming since the earlier, "landmark" studies (e.g., Havelock, 1969; Rogers and Shoemaker, 1971; Glaser et al., 1976). One should be aware, however, that most of the work in D&U has been in the neo-positivist vein, and that its basic objective has been to derive a "soft technology" for getting knowledge which is produced in centers of research into the hands of practitioners.

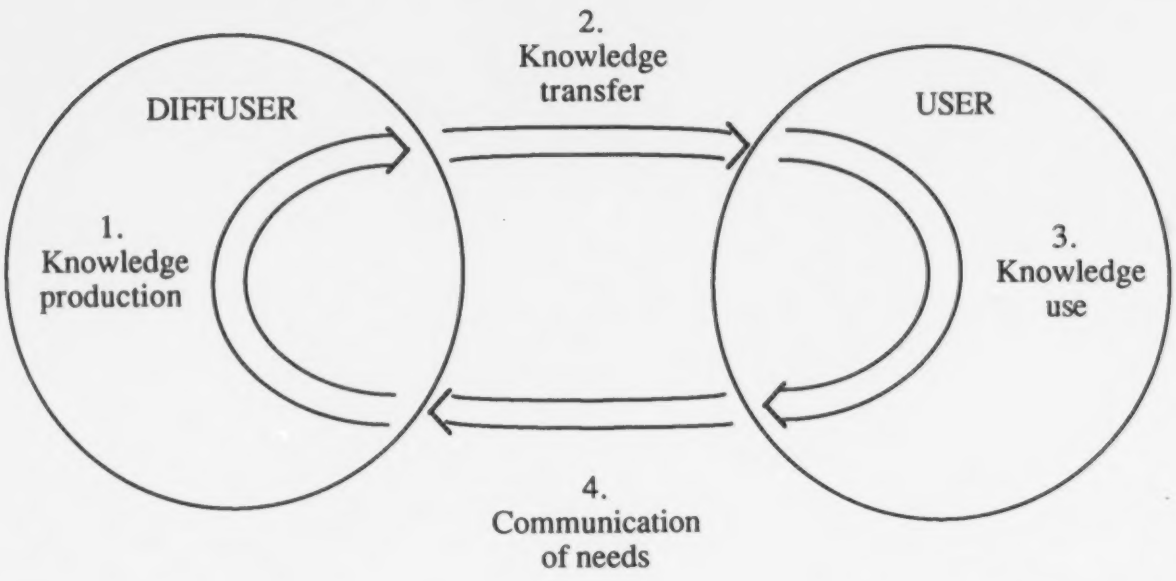
It might be useful, at this point of the paper, to represent the problem in a schematic form:

Figure 1 about here

In the logic of D&U research, there are two ways in which researchers and "users" can interact. The first path runs along the top of the figure (1 --> 2 --> 3). Research is generated in a "scientific" universe, with the aim of contributing to a specific body of knowledge, then is transferred to practitioners. The bulk of research in the D&U community has to do with the transfer process and the conditions under which it can be accelerated without an undue amount of "distortion" on the part of users.

The bottom path of the figure puts us more clearly in the action research tradition; the practitioners define the type of knowledge they require, and the research community frames its next raft of studies around those needs. Typically, a research community will divide its work between the two paths of the figure, by generating some knowledge in response to user needs and other scientific work to more purely conceptual issues.

Two further points are warranted here. First, figure 1 assumes that there is a relationship between user and diffuser, that both parties have come to some sort of "dialogue." As it happens, this is a fairly rare arrangement. The conventional path is shown on the following figure (Huberman, 1973), in which one sees the "natural" --and exceedingly slow --diffusion of research findings as they meander their way through professional schools and scientific associations, professional journals and leadership, then to the majority of practicioner membership. For any given piece of research, this can take up to 50 years, although te process is accelerated be


2.
Knowledge
transfer
DIFFUSER
USER
1.
Knowledge
production
3.
Knowledge
use
4.
Communication
of needs

"boundary-spanners, people working in two of the professional universes on the figure.

Figure 2 about here

A second point. Other, more elaborate arrangements are equally possible. For example, figure 3 shows a functional linkage that depends on temporary projects between an university and an educational laboratory, then on collaborative action projects between schools and the lab. The hypothesis here is that the lab is the most likely partner to interpret and to service local needs, and to negotiate many of them with knowledge-producing institutions. In this instance, the university is a sort of "field agent" facilitating the distance betweeen its practice, frameworks and products as these find their way into the schools.

Figure 3 about here

ROBUST FINDINGS: THE CONSTRUCT OF "SUSTAINED INTERACTIVITY"

Figure 1 suggests that researchers and practitioners will interact at two points: as the knowledge base is transferred, and as practitioners communicate their needs to researchers. For the remainder of this paper, I shall center on the dynamics regulating the process of transfer, i.e., on the "classic" flow of knowledge from research centres to schools and teachers.

One of the more robust findings in the research utilization literature has to do with the strong relationship between the type or intensity of dissemination of research findings and the measured effects on a target public of "users." In particular, in studies in which researchers have used an approach to the dissemination of their results which can be characterized as **"sustained interactivity,"** the impact of the study on users and user organizations is pronounced. This is as much the case for educational research as in other domains, from vocational rehabilitation to waste management (e.g., Muthard and Felice, 1982; Johnson, 1985; Yin and Moore, 1985; Cohen, Sargent and Sechrest, 1986). It is also worth noting that the same construct has figured prominently in the evaluation utilization literature (cf. Cousins and Leithwood, 1986; Marsh and Glassick, 1987).

What is "sustained interactivity?" Basically, it involves multiple exchanges between researchers and potential "users" of that research at different phases of the study. For example, exchanges initiated by researchers prior to the actual conduct of the study typically have two functions: (a) identifying the points of convergence between the scope of the study and the "priorities" or "interests" of the target publics; and (b) recruiting one or more key actors in the target public to follow the study and to help carry it into the user organization.

Exchanges initiated during the conduct of the study usually include the following: (a) creating a mechanism for including

Fig. 2 : The interface of research and practice.

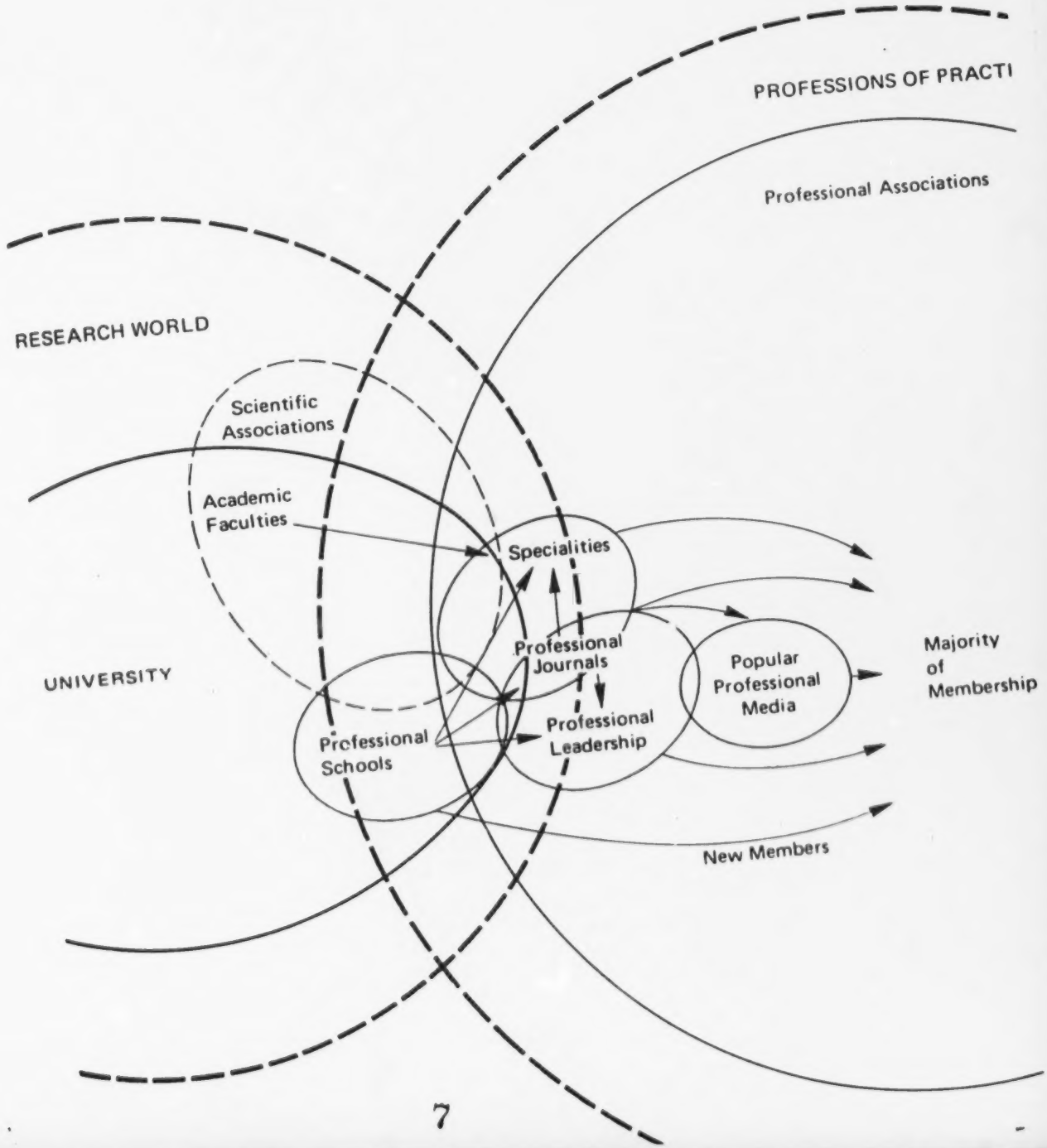
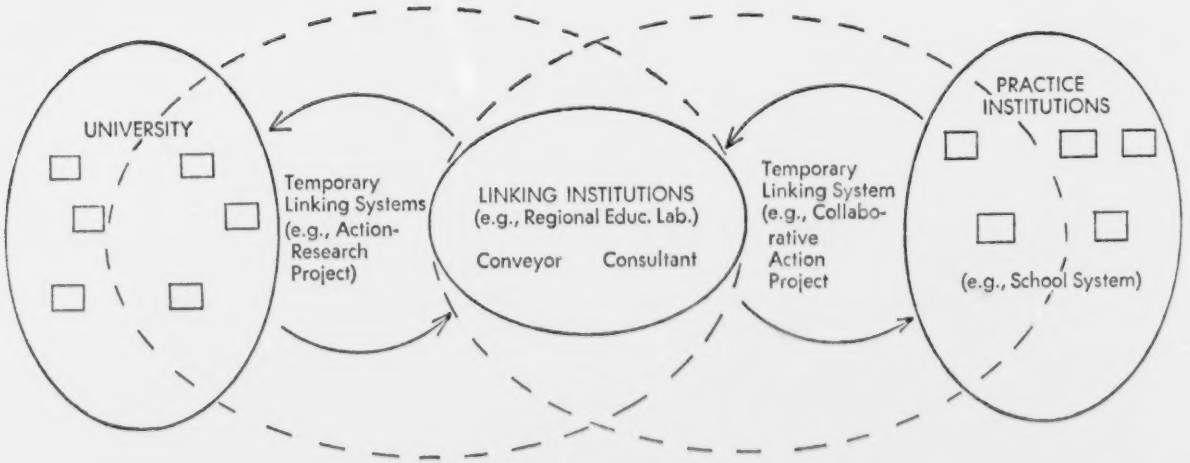


Figure 3

LINKING INSTITUTIONS: SEPARATENESS AND TOGETHERNESS



Solid lines represent **permanent** systems
Dotted lines represent **temporary** systems

members of the target public in the review and analysis of intermediate findings; (b) identifying the data sets of greatest potential interest or use to the target public; (c) envisaging the ways in which these data can be compiled in forms most likely to flow smoothly in internal channels of communication and decision-making (internal newsletters, training facilities, study groups, planning councils); (d)leaving "slack" time for more informal exchanges.

Next, "sustained interactivity" usually includes the following exchanges during the analysis and write-up phase of a study: (a) specification of a dissemination plan, including the roles to be played by researchers and users who have folllowed the study; (b) negotiating for the allotment of time and other resources required to bring the study in the users' setting; (c) discussing in depth the findings most likely to challenge local norms, objectives and working arrangements, and sorting out the superficial from the real sources of discrepancy.

In most instances, there is, at best, modest activity at any one of these phases. The pace picks up, however, during the following phase, during which the study findings are brought directly to the user organization. In many instances, in fact, **this** is how the dissemination of research is often construed: as something one does more or less energetically once a study is completed. The "sustained interactivity" construct, by contrast, dictates a larger number of transactions over a longer period of time. It also conceives this last phase more as an ongoing "conversation" between researchers and practitioners around the import of the study than as a straightforward extrapolation from the findings to the local setting.

The list of interventions and exchanges during this ultimate phase is a long one. Combining some of the items allows for some economy:

.translating findings into contextually grounded, semi-operational forms, e.g., alternative ideas of what study results can mean locally, of what can be "done" with them;

."nourishing" intermediaries, i.e., providing inputs and advice to local actors recruited earlier in the process to bring the study into the host setting;

.mixing "readable" written products with in-person interventions on the part of the research team;

.staying with the user setting over time, typically to the point where internal discussion, training and decision-making mechanisms have engaged actively with the findings;

.focusing on "alterable" variables, i.e., on connections between the study's findings and policies or practices within the user environment that are judged amenable to change;

.scouting out and taking into account local susceptibilities;

.going beyond the study, i.e., engaging with users on issues of local significance or controversy for which the study has no specific answers but in which the researcher has conceptual or practical expertise.

If one reads this catalogue closely, stripping away some of the "meliorist" turns of phrase and remembering that this is a researchers' eye view, one can see that the constuct is less "technological" than it might appear at first. Users are not construed simply as "targets" but as actors who will transform the knowledge base in line with their own representations of the problem. Also, the process of knowledge transfer is seen as a series of transactions, in which study findings are "negotiated" between the two parties. In particular, there is an implicit assumption that researchers and users will be negotiating the meaning of the study and the validity of its findings.

"Sustained interactivity" contains another premise: in the final phase of dissemination, the researcher will be trading on his expertise to legitimate his or her claims against truth claims made by other actors trading on their formal status, on their experience, on their access to other sources of information, on their informal influence,etc. Put in a slightly different way, the model acknowledges the micro-politics of information use in social settings. Both the researchers and their findings are likely to be pawns in other negotiations taking place in the settings in which they venture: negotiations having essentially to do with influence and power. This means that that there will be attempts locally to transform, to distort, to make illegitimate inferences from the findings of a given study for "strategic" reasons. In fact, a prime reason for the researcher's remaining active in the setting after completion of the study is to attenuate these effects by advocating <u>his</u> or <u>her</u> interpretation of the findings.

Research showing the effects of "sustained activity" typically centers on practitioners or "users" in different settings. In the following sections, I shall try to illustrate such effects. At the same time, there is the other side of the coin: **what does "sustained interactivity" do to researchers?** Does it have an effect on their next piece of research, on their conceptual frames, on their teaching, on their attitude towards dissemination? The latter part of the paper will take up this issue.

AN ILLUSTRATION: RESEARCH UTILIZATION IN VOCATIONAL TRAINING

To illustrate some of the dynamics we have just reviewed, I shall be drawing on a recent study in the field of vocational training. Since the descriptive information is available elsewhere (Huberman and Gather Thurler, 1991), I shall take some short-cuts. In particular, I shall cut back on methodological details.

Approximately 15 years ago, the Swiss National Research Council created a series of "national" programs of applied research. In the first wave, for example, were integrated programs in preventive medicine, water purification, social integration and energy. In the next series were programs in micro-electronics, health policy, vocational training and regional development. Each program has contained roughly 25-30 distinct studies; budgets for each range from $3.5 to $10 million. The total budget to date is roughly $280 million.

Up to now, there has been no systematic assessment of the degree to which these national programs have, in fact, been "applied." Implicitly, the definition has been restrictive; "applied" means "problem-centered" rather than the extrapolation of findings to contexts of use. Several programs, however, have taken a more aggressive stance toward dissemination, notably the one in vocational education, in which 10% of the program funds were set aside explicitly for dissemination work outside the scientific community. Projects including a dessimination design could qualify for funding, but applicants had to specify dissemination objectives, target publics, even message types and timelines. For most, it was the first foray either outside the scientific community or beyond an ad hoc approach to dissemination of their findings to practitioners.

This research program, entitled EVA ("Education et Vie active"), itself consisted of some 25 projects, divided thematically into studies of (a) future apprentices' personality development, scholastic and technical performance and vocational maturity; and (b) characteristics of schools and teacher-training institutions. The median project lasted 3-4 years, was conducted by an experienced principal investigator housed in an university institute and cost about $160,000.

Figure 4 (next page) lays out the general model for the study and indicates that more specific models were derived for variable sets relating to researchers, users and attempts to disseminate the findings of the studies. The variables in these models derive from the D&U literature reviewed earlier. As the general model shows, organizational and contextual variables in both the researcher and user universes determine the shape and extent of linkage, both generally (in terms of interdependencies preceding the study) and in the case of the specific study being disseminated. Degree of linkage is then presumed to determine the variable sets on which we shall be concentrating first in this paper: the dissemination "effort" and the predictors of use within the practitioner's environment (e.g., time and resources committed to the study, relationship between the main findings of the study and the unit's major objectives or working arrangements). These variable sets, in turn, mediate the outcomes. The primary outcomes are multiple (scope, relative influence of the study, degree of local transformation of findings,etc.), but we shall be addressing only changes in levels of knowledge, understanding or attitude (**"conceptual" use**) and, tangentially, changes in behaviors and practices (**"instrumental" use**). The study also measured a raft of second-order effects, as shown in the figure.

Figure 4
General Model of the EVA Study

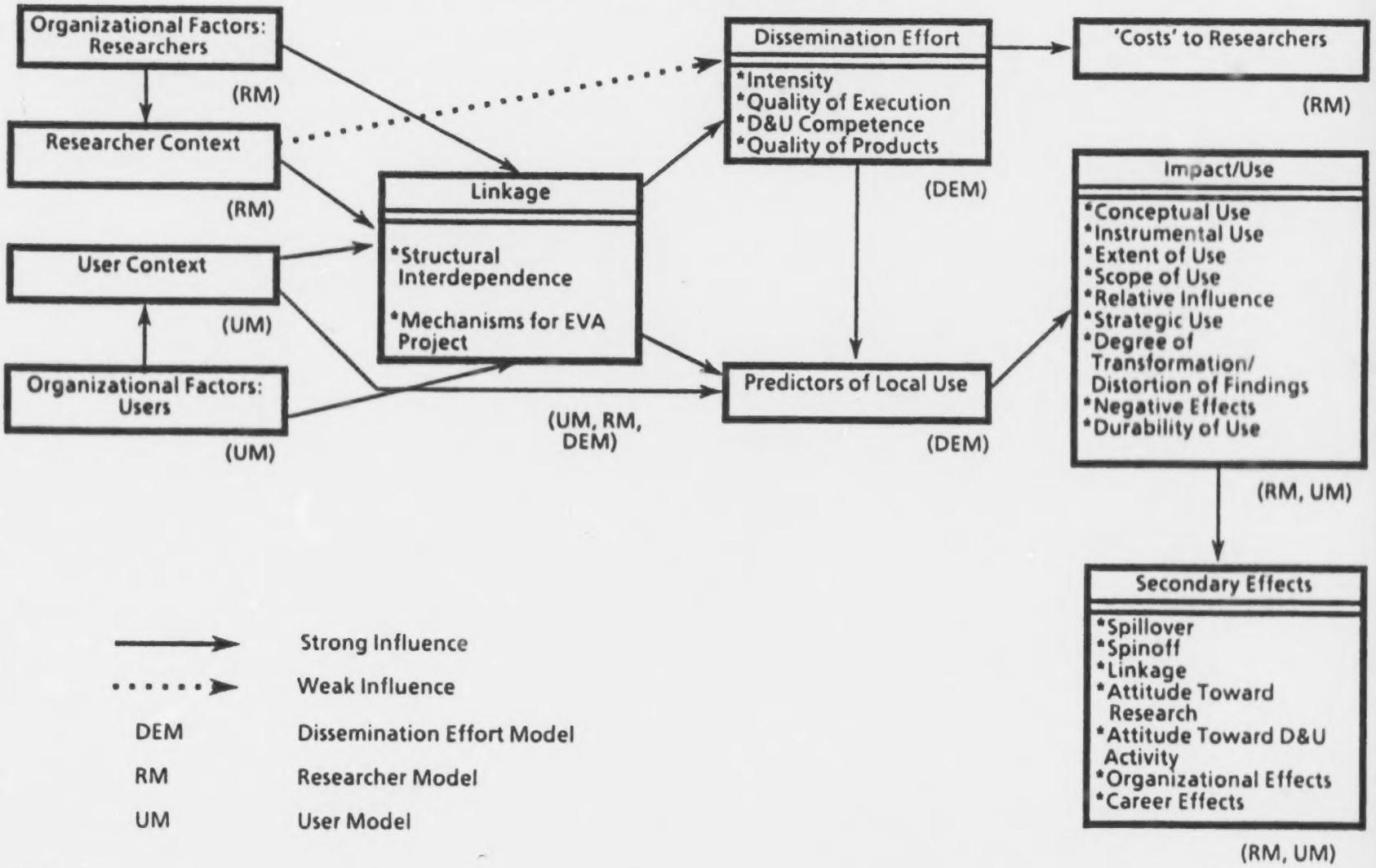


Figure 4 about here

While the dissemination study as a whole addressed a host of research questions within and across these variable sets, I shall take up here the **questions relating specifically to the first-order outcomes (conceptual and instrumental use) and to their immediate predictors.**

Methodologically, the EVA study was designed as a multiple-case, "tracer" study. We picked up a sample of projects near the end of the research phase, preceding by several months the post-study dissemination activities, and followed each for about 18 months. By identifying target publics with whom research or dissemination staff interacted, we followed the traces of the study until they petered out, measuring the various impacts along the way and recycling periodically to see whether the initial degree of impact grew or waned over time.

Twelve of the 26 program projects were selected for study. All 12 constituted a "major" research project (>$150,000) and contained an explicit dissemination component. Variation was sought in geographical location and in the institutional "nesting" of the research team (university, independent institute, cantonal research service). In the course of study, one project was dropped due to lack of cooperation on the part of the principal investigator.

For each of the remaining 11 projets, principal investigators were asked to identify 2 "target publics" who were, or would be, affected by the dissemination being envisaged. This allowed for the study of the "strongest cases," i.e., instances in which effects of the dissemination were theoretically the greatest. But we assumed as well that differential efforts to disseminate the findings to these publics would provide enough variation in outcomes to drive the analysis. This assumption was borne out.

The strategy for data collection and analysis was derived from several sources, but above all from Miles and Huberman (1984) It consisted of a multiple-case field study of a largely "investigative" nature. In line with this approach, field data were collected in several "waves," with successive sequences of analysis that re-oriented or differentiated the next round of data collection. Such an iterative mode of data collection allows for interview questions, observations and retrieval of documents or products to shift over time. Researchers then focus progressively on those mediator and outcome variables emerging from each successive "pass" at the field as critical indices or determinants.

MEASURES OF CONCEPTUAL EFFECTS

Now for a closer look at the outcome having to do with effects of the EVA research projects on practitioners' knowledge, understanding, perceptions and ideas. The general line of inquiry followed in the interviews was the following:

did the findings of the EVA study have any measurable effect on users' understanding of the phenomenon under study and on its pertinence in their context? Did they, for example, construe their own work situation differently (as trainer, journeyman, head of personnel, vocational counselor) and, if so, what was the precise relationship between the findings of the study and this new perception? Did they derive new ideas or become more aware of their own behavior or of phenomena around them to which they had been oblivious? Alternatively, were they more perplexed than before?

Prior to these questions, some open-ended and others nested in scales, informants were probed carefully as to their understanding of the study and its findings. They were asked, at various moments, to resume the main findings, to identify the problem area which the study addressed, to illustrate the import of the findings by connecting them to their own work and to their organizations. When conceptual effects were claimed, informants were asked to justify them, usually by giving examples, but also by connecting them to more "instrumental" effects (changes in tools or methods of daily work; changes in policies or practices at a more institutional level). In the cases of claims of particularly strong effects, we checked for corroboration from colleagues and/or conducted on-site observations.

Several measures were derived from these data. One, testing conceptual mastery of the study and its import locally, ranked each informant (n =103) on an ordinal scale, running from "no effect" to "sensitization" to "basic assimilation" to "strong understanding" and finally to "integrated understanding." Instances of "strong understanding" required clear conceptual connections between the main findings of the study and the informants' work situation. Such, in fact, was the modal case; 41 of the informants (40%) fell into this category. These are, to be sure, unusually strong effects in the research utilization literature, and are explained largely by the fact that all members of the sample were the target of a more or less intensive dissemination of the findings on the part of the respective research teams. The general drift of informants' comments is that they have come to a "deeper" understanding of the meaning of such findings in their work environment -- see it in a more differentiated,precise, self-conscious yet also "de-centered" way, "as if someone shone a light in a dark room I walk around in all the time." Again, claims such as these were subjected to stiff cross-examination.

If we look beyond the modal effect at the individual level to the distribution across the 23 cases, with each individual aggregated to case level, the "mean" coefficient is at the "global assimilation" level: one understands the import of the study and can identify correctly its ramifications locally, but not at a more general level. Here, then, at the "mean," the cases of "no effect"(19%) and of "sensitization" (12%) begin to take their toll. But the aggregated data also show a clear and fascinating within-case trend: **levels of conceptual mastery are far higher among informants associated earlier with the study (as members of an advisory panel, for example) or associated**

more intensively (as intermediaries) in the local dissemination. This is the case as much for instances in which the host organization was receptive to the findings of the study as for unreceptive units. These levels are also higher, as we shall see, in instances of more intensive dissemination on the part of the research team.

A second, more general, cognitive scale was generated from the same data sources. This one ranked informants ordinally from "no/minor conceptual effect" (34% of the cases), "demonstrable awareness" (34%), "moderate changes of perspective" (22%) and "new conception -- multiple changes of perspective"(10%). Here again, remember that, for the majority of informants, this was the first time since post-secondary studies that they had come to grips with a research project in such detail and that, in many instances, practitioners in the area of vocational training were initially hostile to social scientific research in their field ("half common sense, half nonsense," said one during an initial interview). With one-third of the respondents rated at "moderate/multiple changes of perspective," we are in the universe of strong effects.

We also extracted items relating to conceptual effects and derived from the scales administrated to informants. Here is a summary table:

table 1 about here

Although these are self-report data, they were collected in face-to-face interactions by researchers who had come to know the local surround and who asked these practitioners for details which were then checked out. Moreover, in this particular study, there was no strategic reason for practitioners to inflate their judgments.

These judgments are fairly "positive:" 40% of the users claiming unequivocal conceptual effects, over half the users claiming strong effects at the levels of "better understanding" and "new ideas." If we pool the "yes" and "somewhat" responses, most items show conceptual effects for more than half the sample. This is all the more striking when one considers that, up to now, the research community and the vocational training community in Switzerland had had virtually no prior relationships. Furthermore, initial measures of practitioners' attitudes toward social science research and researchers ranged generally from "sceptical" to "hostile." For field researchers as well, it was difficult to attribute these conceptual effects to other factors than to the dissemination effort on the part of several research teams. More on this shortly.

The self-report data were combined with the two other measures of conceptual use to produce a weighted score for individuals ($W = .61$, $p < .01$) and for units ($W = .57$, $p < .01$), then ranked. It is with these unit-level rankings that we will be working shortly.

Table 1. Conceptual effects: summary of scale items (n=95)

This study...	yes	somewhat	no
Helped me to understand better the problem area generally	56	23	16
Made me aware of some important things I didn't know about	36	31	28
Helped me to better understand my own work environment	29	23	37
Gave me some new ideas	53	23	37
Made me look at things differently, from another perspective	29	31	33
Made me aware of some things I shouldn't be doing	25	19	49
Has contributed to changing my ideas about my work in the future	24	30	39
totals (652)	252	180	220
relative %	39%	27%	34%

A NOTE ON INSTRUMENTAL EFFECTS

There is too little space to develop these findings, beyond reporting that, in many instances, what we called "instrumental" effects (changes in tools or methods of daily work; changes in policies or practices at a more institutional level) were also prominent. For example, 27% of the informants (n =73) named clear instances in which the EVA study findings had pushed them to action in an arena in which, up to now, they had hesitated entering. Some 20% documented instances of the findings' having resolved a particular problem at work. Some 13% attributed changes in ongoing activities to the influence of the EVA study with which they had come into contact.

In addition, many of these effects transcended the individual level. From interviews and observations, we estimated that, in 14% of the cases (n=99), the EVA study had accelerated the formulation of a policy; in 8%, the study had contributed to the adoption of a policy decision. In 25% of the cases, the study had acted to change the profile of ongoing instututional activities in a modest way (e.g., new programmes, changes in apprenticeship training, new orientation batteries), and in 17% of the cases, these changes affected the core or principal activities of the institution. In the remaining 36% of the cases, no institutional effects were found. Here again, we have unusually strong effects, especially when one considers the social and epistemological distance separating practitioners from researchers in the field of vocational education, be it in Switzerland or elsewhere.

PREDICTORS OF CONCEPTUAL EFFECTS

How does one get such strong effects? Which variables discriminate between cases of high conceptual or instrumental use and cases leaving little or no traces among practitioners?

Lacking space here to describe the full set of variables in play here, let us move to the final, most integrative analysis. Here, we were essentially trying to "predict" the level of conceptual effects from (a) the kinds and intensity of dissemination undertaken by the various research teams and (b) the response of informants' units to the dissemination. It is important to note here that, in terms of the "sustained interactivity" construct discussed earlier, **we shall only be looking at variables in play during the last phase of the dissemination process, when the study findings are brought directly to the practitioner setting**. Having both scale scores and ranks for the level of conceptual effects, the task was then to determine which "dissemination" and "response" variables discriminated between cases with higher and lower levels of conceptual effects. With a sample of 23 cases, we resorted mainly, but not exclusively, to qualitative analyses.

In this analysis, covering 20 cases with a complete data set, the field researcher worked only with those variables shown to have exerted a "determinative" influence in the case.

In other words, from the full set of variables posited in the conceptual framework or emerging gradually after successive "waves" of data collection and analysis, the researcher gradually winnows the list to a small number which exert, unambiguously, a directional influence on another variable -- for our purposes here, on an outcome variable. Typically, this judgment is made from the progressive analysis of scales, observations and interview data, and is tested independently by a colleague (cf. Miles and Huberman, 1984; Guba and Lincoln, 1985).

Unlike the corresponding statistical analyses (e.g., regression, discriminant analysis), we are working here with a smaller set of cases, ones in which the variables of interest have "passed" a preliminary, qualitative test of significance. So we have sacrificed degrees of freedom by throwing away cases for which we had a measure but decided, upon gradual examination of its local workings, that it added little light to the analysis of the case. Next, each of the surviving variables is rated (low, moderate, high), and the "moderate" cases are discarded, basically to facilitate the use of basic qualitative tools, i.e., comparison and contrast. **We are thus left with variables judged as exerting a determining influence on another predictor or on the outcome, and judged as "high" in instances of strong outcomes and "low" in instances of weak outcomes."**

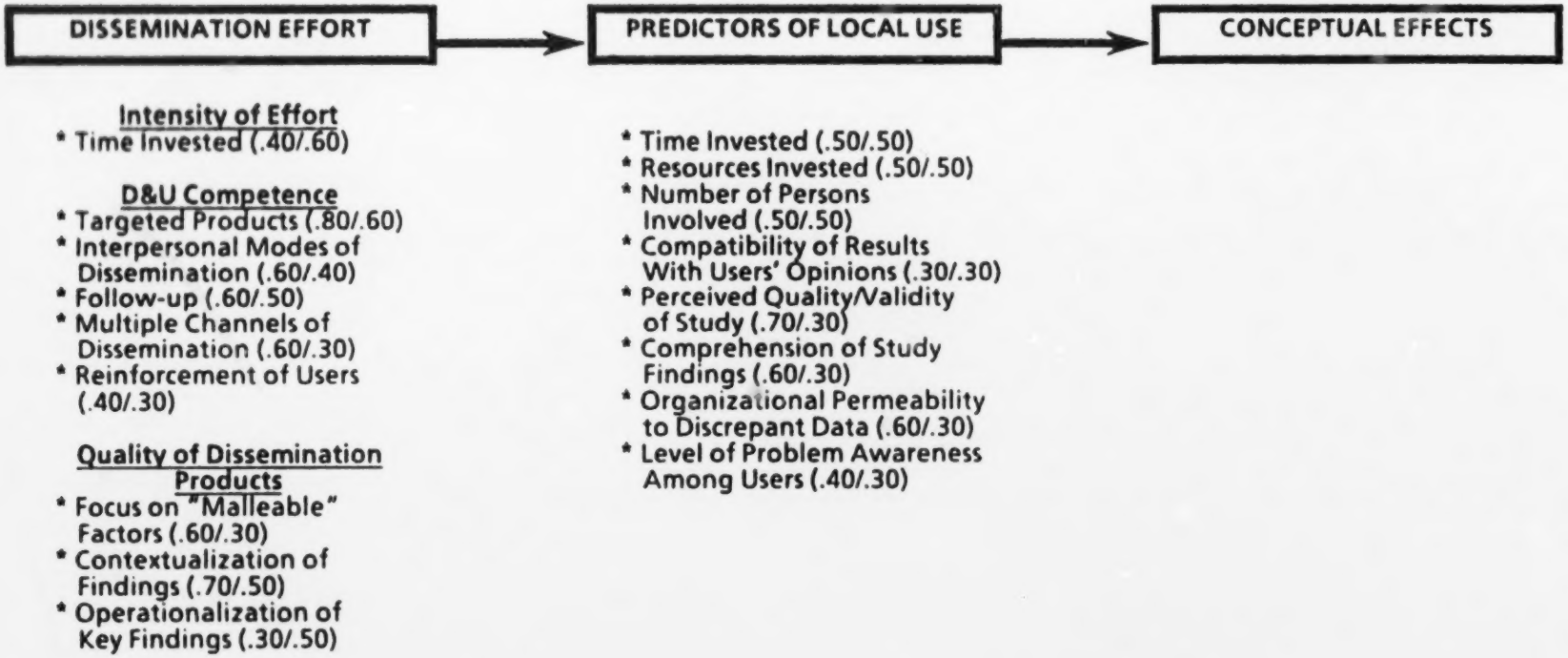
How does this play out in the case of "dissemination effort," "predictors of local use" and "conceptual effects?" Let us examine a simplified chart which displays only those variables present in 30% of the cases:

(See figure 5, next page)

This is a busy figure, but it repays a close reading. Globally, these are the "surviving" variables, the ones that predict different levels of outcome. To facilitate a closer reading, let us illustrate with a highly "significant" variable, "targeted products." In 8 of 10 cases of strong conceptual outcomes, use of dissemination products tailored specifically to the target public -- as opposed to omnibus reports, monographs, workshops,etc.) - was associated directly with one or more of the predictors and/or associated with high conceptual outcomes. Conversely, in 6 of 10 cases where targeted products were <u>not</u> used and were judged as affecting adversely, say, time and resources invested locally, this lead in turn to null or low conceptual effects.

Whereas in each case-level analysis, the analysis explicates specific links between distinct variables, before moving to "families" of cases with similar paths, figure 5 regroups the variable into blocks. It does, however, plot fairly well the factors which variously turn on or turn off the power among practitioner units and, from there, which heighten or lower the conceptual impact of the study locally. It also suggests that the <u>presence</u> of certain factors can matter more in increasing

Figure 5
Conceptual Effects: Explanatory Model


DISSEMINATION EFFORT
PREDICTORS OF LOCAL USE
CONCEPTUAL EFFECTS
Intensity of Effort
* Time Invested (.40/.60)
D&U Competence
* Targeted Products (.80/.60)
* Interpersonal Modes of Dissemination (.60/.40)
* Follow-up (.60/.50)
* Multiple Channels of Dissemination (.60/.30)
* Reinforcement of Users (.40/.30)
Quality of Dissemination Products
* Focus on "Malleable" Factors (.60/.30)
* Contextualization of Findings (.70/.50)
* Operationalization of Key Findings (.30/.50)
* Time Invested (.50/.50)
* Resources Invested (.50/.50)
* Number of Persons Involved (.50/.50)
* Compatibility of Results With Users' Opinions (.30/.30)
* Perceived Quality/Validity of Study (.70/.30)
* Comprehension of Study Findings (.60/.30)
* Organizational Permeability to Discrepant Data (.60/.30)
* Level of Problem Awareness Among Users (.40/.30)

NOTE: The notation (.40/.60) indicates that in 4 cases out of 10 with strong conceptual effects, this variable is judged to be "high," and in 6 cases out of 10 with weak conceptual effects, this variable is judged to be "low." The same notation is used for the other variables in the figure.

conceptual effects than their absence can lead to null or low effects. This is the case, for example, with "multiple channels of dissemination" (print, visual, in-person), for the focus on "malleable" factors in the setting, for the perceived quality or validity of the study, for the comprehension of findings, etc. Higher levels "help" more than lower levels "hurt." The inverse case is less frequent. For example, not "operationalizing" study findings in the local context and investing little time in the dissemination activity are associated, directly or indirectly, with lower conceptual effects on target publics.

Taken together, the figure tells a story, with a few subplots. It says that the most promising dissemination strategy for obtaining conceptual effects on a target public implies a consequential time investment, especially when study findings become available, including a follow-up period, personal contacts in addition to reports and other media, with some concern for users' motivation (reinforcement). The products of that dissemination are put in context, trained on factors that can be influenced and connected to ongoing operations. Very likely, the "follow-up" variable is crucial; researchers who spend time in the setting come to learn its ground rules, see its malleable features, figure out where the findings are most relevant, reinforce their writings with personal interventions, identify key actors and reinforce them,etc. This is, in effect, the "sustained" component of "sustained interactivity."

The dissemination strategy just described acts to improve the level of understanding of the findings among practitioners, to increase the perception of their validity in the setting and, in response to the time invested by researchers, to inrease the corresponding investment (in time, in resources, in numbers of persons or services involved). The product of that investment, seen linearly, is strong conceptual mastery of the study, both of its more general aspects and of its local significance. If we turn the same variables on their heads, we see that little time invested, no follow-up,etc. lead to lower comprehension and minimal investment in the study's findings among practitioners for whom, under questioning, the study in question is a remote memory trace.

The other subplot highlights the same factors in the "Dissemination effort" variable set (intensity of effort, competence in dissemination and utilization strategies, quality of products), but insists generally that such efforts will not automatically engage users, unless findings are compatible with users' opinions, unless people bring to the study a minimal conceptual awareness of the factors at stake and the organization is permeable to findings that go against the grain. These are good illustrations of more "conflict-laden" or "transactional" variables in action.

At the case level, these trends are more complex. For example, when users treat findings as incompatible with their basic policies or practices, some researchers lower the amount of time invested, reduce the interpersonal modes of

dissemination, reduce follow up, etc., and conceptual effects drop correspondingly. In other instances, however, low compatibility or local resistance stimulates the investment of researchers, notably those who have already committed themselves over time to this target public, and who then intensify some aspects of their dissemination "competence" and turn the situation around. In other words, instances of low problem awareness or internal conflict or low comprehension of the study's findings do not necessarily weaken or stymie sustained modes of dissemination, especially in the case of more professional ("D & U-savvy") or more committed research teams.

As supporting evidence, partial correlations (Kendall Tau) were run on these variable sets. The effects of "intensity of effort" and of "D&U competence" clearly overrode the the variables associated with the local setting ("predictors of local use" on figure 5). In other words, what researchers do or don't do, along with the investment they make, counts more than do the features of the practitioner environment they engage with.

In effect, the engagement of the researcher in the user's setting changes many of the cards being played. When researchers essentially hand off a study to a set of practitioners, low levels of "problem awareness" and low "permeability to unwelcome findings" usually spell instant oblivion for the study, however valid and well-packaged its findings. When, on the other hand, researcher teams remain active in the setting over time, and negotiate their presence carefully, we are likely to get an upward shift in the level of problem awareness and a far clearer sense of which findings are, in fact, discrepant with local objectives and mores. Among the cases in this study are instances of both types. On the other hand, researchers reacting this way are brought more clearly into the micro-politics of the setting. The various transactions between reseachers and practitioners in the setting highlight the "interactivity" component of the "sustained interactivity" construct.

By way of an intermediate summary, we should note that those variables listed on the figure under "Dissemination effort" -- the ones that discriminate most clearly among instances of high and low conceptual use of research findings -- are, in all cases, components of what we listed as "sustained interactivity" earlier in this paper. These components imply, to be sure, deliberate, skilled and effortful activity on the part of researchers, but they also assume a transactional frame of reference. As it passes into the practitioner community, research knowledge is not "communicated"; it is negotiated and, invariably, it is reelaborated to fit the body of prior knowledge and frames of meaning which users bring to any new piece of information. It is, in fact, the very activity and tension inherent in that process of negotiated re-elaboration which assures a higher level of retention and use at the individual level. Without it, we have non-existent or ephemeral effects among practitioners or, alternatively, a raft of distortions and simplifications relative to the original

findings.

THE EFFECTS OF DISSEMINATION ON RESEARCHERS

Up to now, I have tried to make the case that certain kinds of dissemination of research, and above all, of kinds that entail sustained interactions between researchers and practitioners, can have measurably strong effects on those practitioners. In other words, there are ways to bridge the gap between theory and practice, even in settings that are initially hostile to theorists.

What I now want to address is a cognate question, and one for which the data base is thinner: what effects does sustained interaction have on researchers? Surprisingly, this is a question which is virtually absent in the D&U literature.

Some initial hints appear in the interviews in which researchers (n = 35) were asked about the impact of their study on other aspects of their work. Predictably, virtually all respondents evoke a greater conceptual and empirical mastery of the domain represented in their project. When asked to explain themselves a bit more, roughly 15% of this group say spontaneously that the dissemination component was an important factor in their obtaining greater conceptual mastery of the field under study. As one principal investigator put it, whimsically: "When you have to discuss, explain and illustrate your study, then answer to their (practitioners') criticisms, you end up understanding more about your study than you did when you wrote the report." This is, I think, a telling remark and I shall come back to it in a slightly different form.

Some more hints appear when researchers are asked about effects on their teaching or professional practice. Here again, two-thirds of the researchers report that they had already transposed conceptual frames, illustrations, segments of their data base into their teaching or their work with clients. Again, there appeared, here and there, the spontaneous remark that having to convert these materials into forms more suitable to non-specialists during the dissemination of the study, rendered the materials far more user-friendly, more didactic in nature. In a third of the cases, researchers claimed that their "stance" toward teaching had changed as a result of the dissemination component of EVA. The gist of their remarks was that they were now more sensitized to the characteristics of the students or clients with whom they dealt --more aware of the ways in which these people represented in their own minds the questions or content at hand. The stock phrase here was "more centered on the learner than before," often as a result of having to "de-center" from their own perspectives and formulations when explicating their study with various practitioner groups.

Not surprisingly, 89% of the researchers considered themselves better than before at disseminating their findings to non-specialists. More interesting, perhaps, are the data bearing on the evolution of researchers' feelings about the

dissemination component in their work. In the initial phase of the study, when researchers were still collecting or analyzing data, they were administered a scale (Kendall's W = .76) of 9 statements and asked about their agreement with each. Generally, these statements had to do with eventual "problems" arising from work with practitioners during or after a study, e.g, that time and energy would be diverted from the study, that non-specialists would simplify or distort findings, that researchers would be drawn into a political arena, that researchers were not competent in matters of dissemination, that practitioners were looking for "magical" solutions.

The same scale was administered 18 months later, when the dissemination component was completed or nearly completed. There was a significant shift in the direction of a lesser apprehension (Sandler's A =.153, 8df, p. <005), both about what practitioners would do with research findings and about the perils of researchers' committing time and energy to such tasks. It is noteworthy that the sharpest changes come from research teams with the **least** experience in dissemination outside the scientific community. Here again, the gist of researchers' remarks during the second administration of the scale was that non-specialists were often far more "savvy" than researchers had imagined, and that there had been less "distortion" than they had feared. This was especially the case for teams which had designed the dissemination component as a series of encounters over time with the same target publics.

AN HYPOTHESIS

Because our study was more measurement-sensitive to the effects of dissemination efforts on practitioners, we paid less attention to what was happening to researchers during these encounters over time with non-researchers or non-specialists. But there are several indicators that something was happening to people in the research teams who had invested the most in "sustained interactivity." We see it in their remarks about the conceptual enrichment resulting from their study, about the transposition of materials from their studies to their teaching and consulting and in the shift of attitudes about work with practitioners more generally.

My hypothesis is fairly straightforward. The fact of having to reframe one's findings in different ways for different publics, and of having to address counter-examples, qualifications and outright challenges on the part of practitioners testing the research findings against their own experience and local context, appears to trigger a decentering process among researchers. The field talks back, both more strongly and in a different way than, say, a replication or a set of generalizability coefficients typically provide to a study.

Let me run through an example. Suppose that a research team, on completion of a study on career choices of adolescents, engages for a year in a fairly intensive discussion with a dozen, experienced vocational counselors. Two things, I think,

would start happening after the first 2-3 sessions. First, the practitioners would gradually submit a barrage of counter-examples, of reservations, of important factors not included in the study, of contextual factors underweighted in the study, perhaps even of constructs that run against the conceptual grain of the study. After all, these are experienced people. Some would have tested or interviewed hundreds of adolescents and derived their own ideas about the key determinants of career choice. Even if there are sharp differences, even contradictions, between the counselors, we can safely assume that the research team will be struck by some of the remarks made and by the drift of the discussion over time. This over-time aspect is crucial; it obliges both parties to continue their debate or their dialogue over a period long-enough for reciprocal influences to be exerted.

The second thing that occurs, I think, is that the researchers are obliged, early on, to go **outside** the particular study at hand in order to respond to the practitioners. This entails their marshalling many of the key concepts they trade on when a study is mounted, concepts having to do with adolescent development, with career choice, with tests of vocational maturity,etc. In many ways, in fact, the **real** confrontation occurs at this level, where both sides have staked their understanding of the underlying determinants.

As we saw earlier, when researchers resorted to a long and interactive mode of dissemination, there were consequential conceptual changes among the target publics: new understandings, new ideas, different ways of thinking about their work, and the like. There were even instrumental effects: changes in patterns of monitoring or teaching apprentices. There are enough compelling data from the EVA study to safely assume that much of this was due to the kinds of exchanges we have just created in our fictitious example. Conversely, there is good reason to think that these interactions would have a reciprocal effect on the researchers engaged in them, unless these researchers dominated the exchanges. Our observations indicate that they did not.

The question remains: how exactly are such effects obtained?

On the face of it, this scenario looks like a classic instance of what cognitive psychologists call "socio-cognitive conflict (Doise and Mugny, 1981)." Let us run through the scenario briefly, using the principal investigator as our subject. In interacting with a group of experienced practitioners, she will first become aware of the fact that some legitimate criticisms of her study are being made, and that those criticisms derive from other ways of viewing the same phenomena she has studied. Since these criticisms and alternative conceptions do not come from ths scientific community, where she is already well armed, she may at first be disconcerted. At this point, she may decide to dismiss these "alternative" views. But she may also choose to listen more carefully, to ask more probing questions to members of the group and to take a harder look at her data or at her conceptual framework. The further exchanges in the group may

then bring her gradually to integrate this discrepant information into her own conceptual schemata --typically at a higher level of abstraction -- or even to begin changing some of the ways she looks at the kind of research questions addressed in her study. As she goes back to some of her source material, she may find herself reading it in a different way. This "different way" is then brought to bear on the next discussions with the group of counselors. It produces some new, unexpected, unsettling information, since the structure of her new way of representing the phenomena is not stabilized; it feels like a series of uncoordinated conceptual strands. The same cycle then repeats itself, several times. At a later point in these encounters, she will have worked her way through to a conception of the problem which satisfies most of the qualifications and counter-examples put out by members of the group and, at the same time, is conceptually conciliable with at least some lines of inquiry in her professional community. In simple words, she will have changed her mind. Cognitive theory suggests that this change will for the better --that her new set of conceptualizations will be more integrated and differentiated than her prior set (Piaget, 1975)

The key here, for both parties, is probably the fact that they do not function at the same level of conceptualization, nor in the same settings, but they both contend with the same phenomena. As a result, once they get beyond the initial discomfort of defining common meanings and of working out the social dynamics of their encounters, each party is bound to be surprised or annoyed or even shaken by some of the information and the reasoning put forth by the other party. Both bodies of knowledge are "valid," albeit on different grounds, and both are contending for salience and prominence. Were the researchers and the counselors to remain among themselves, there would probably be far fewer instances of cognitive shifts. Each side will have worked out its "stance" toward its referent community, and will not be going out of its way to put it into question.

My hypothesis then, is that such a sustained conversation results in measurable shifts in the ways people construe the issues on the table, and derives from attempts to reconcile the conflicting versions of what those issues mean. The result, for many practitioners, is what we called "conceptual effects." On the face of it, as noted earlier, there should also be a corresponding change among members of a research team.

The problem is that I have only scraps of data to support the thesis of a corresponding change among researchers. The one scrap to be added to the pile comes from a question posed to principal investigators (n = 11) about their future research. Here, researchers with the least amount of prior experience in dissemination outside the scientific community, but who had invested heavily in interactions with different practitioner groups, were far more likely to report that they were now designing studies of a different scope and nature than was the case in their earlier work. In some --but not in all --cases, they attributed this shift to new insights gained during the dissemination process.

I think that this view of things, were it confirmed, has important implications. Up to now, mainstream researchers in education, have often avoided dissemination like the plague. Working with practitioners has been seen as a distraction from their priorities and, in some cases, as a real handicap to professional advancement. Similarly, members of the research community who have devoted blocks of time to "the field" have defined that activity as social activism, or as altruism, or as a gesture of good faith toward the profession at large.

What we see now is that sustained, interactive dissemination is of as much value to researchers as to practitioners, but of value in a different way for each, according to the community in which he looks for professional intelligibility and satisfaction. The value to practitioners has always been obvious: access to new, potentially powerful ideas and tools. The value to researchers has been less clear. If it turns out, however, that interactive modes of dissemination are a booster to conceptual progression, as depicted in my fictitious example, the "payoff" within the research community may be far greater. One would then work through one's findings with a group of experienced practitioners not for reasons of altruism nor of activism, but rather to empower or to refine the conceptual tools with which we researchers ply our trade. Doing it this way, in fact, may often be more beneficial than replicating a study or engaging with colleagues at professional meetings. One might, literally, change one's mind. In other words, if we researchers are interested in changing our minds, we need to take our findings out into the field and observe very carefully how they hold up under duress.

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